REMARKS

The above amendments to the specification, claims and abstract have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122003800. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: July 20, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

For the convenience of the Examiner, the changes made are shown below with deleted text in strikethrough and added text in underline.

In the Specification:

Page 1 before the first paragraph, please delete the following:

~~Description~~

Page 1, between lines 4 and 5 has been amended to include the following:

CLAIM FOR PRIORITY

This application claims priority to International Application No. PCT/DE99/03540 which was published in the German language on May 11, 2000.

TECHNICAL FIELD OF THE INVENTION

Paragraph beginning on line 6 of page 1 has been amended as follows:

The invention relates to a line coupling, and in particular, to the use of a line coupling in a bus system.

Page 1, between lines 7 and 8 has been amended to include the following heading:

BACKGROUND OF THE INVENTION

Paragraph beginning on line 8 of page 1 has been amended as follows:

In a conventional ~~A~~ bus system, ~~is known in which~~ individual stations are typically connected to one another by means of a data bus. The stations interchange data with one another via the data line. The data can be transmitted synchronously or asynchronously, with a multiplex

method usually being used. In this context, access to the data bus can be designed to be arbitrary or to follow particular rules. To this end, the individual stations may have equal authorization to send or receive data. Alternatively, one of the stations may be in the form of a master station which controls the other slave stations and, in particular, their access to the data bus.

Paragraph beginning on line 32 of page 1 has been amended as follows:

It has ~~therefore~~ been proposed that~~, in particular,~~ sections of a bus system which are at risk of being shorted be decoupled from the rest of the bus system in the event of a short circuit on the section, so that the operation of the rest of the bus system is not impaired. To this end, PCT resistors or fuses have been used, for example, at coupling points which connect a section of the bus system which is at risk of being shorted, or another section, to the rest of the bus system.~~,~~ ~~said~~ The PCT resistors or fuses adopt~~ing~~ a high impedance in the event of a large flow of current caused by a short circuit, and hence in the event of great evolution of heat, and thus ~~isolating~~ isolate the shorted bus section from the rest of the bus system. This means that operation is assured on the rest of the bus system. Such coupling to connect two lines for power and/or data transmission, preferably within a bus system, is ~~called~~ referred to as a line coupling ~~below~~. The line coupling links an input line to an output line.

Paragraph beginning on line 16 of page 2 has been amended as follows:

A disadvantage of a line coupling using PCT resistors is that, although the individual bus sections are connected to one another via the PCT resistors with low impedance, they are nevertheless connected using a finite resistance.~~, and h~~ Hence, the number of stations which can be connected to the data line is limited on account of the voltage drop across the PCT resistors.

Page 2 between lines 22 and 23 of page 2 has been amended to include the following:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a line coupling in a bus system, the system having an input line and an output line, comprising, a master station connected to the line coupling via the input line; a first slave station connected to the line coupling via the output line; an isolation resistor coupled between the input line and the output line; a controllable switch connected in parallel with the isolation resistor; and a control circuit controlling the switch on the basis of an output voltage on the output line.

In one aspect of the invention, an evaluator evaluating a control word supplied via the input line, and in which the control circuit is designed to control the switch on the basis of an ascertained control word.

In another aspect of the invention, a voltage tap is provided on the input line, and in which the control circuit is designed to control the switch on the basis of an ascertained input voltage.

In still another aspect of the invention, an evaluator evaluating a control word supplied via the output line, and in which the control circuit is designed to control the switch on the basis of the control word.

In another aspect of the invention, the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value.

In yet another aspect of the invention, the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value and a prescribed control word is detected.

In still another aspect of the invention, the control circuit is designed such that the switch is turned on when the output voltage exceeds a limit value, a prescribed control word is detected and the input voltage exceeds a limit value.

In another aspect of the invention, the control circuit is designed such that the switch is turned on when the output voltage exceeds a limit value, a prescribed control word is detected at the input or at the output and the input voltage exceeds a limit value.

In yet another aspect of the invention, the output line is the input line for another line coupling and the output line of the another line coupling is connected to a second slave station.

In still another aspect of the invention, additional line couplings are connected in series with one another, and a third slave station is arranged between two data coupling stations.

In yet another aspect of the invention, the output line of a last line coupling is connected to the master station.

In another aspect of the invention, the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value and a prescribed control word is detected.

In still another aspect of the invention, the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value and a prescribed control word is detected.

In yet another aspect of the invention, the control circuit is designed such that the switch is turned on when the output voltage exceeds a limit value, a prescribed control word is detected and the input voltage exceeds a further limit value.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the invention and developments thereof are explained in more detail with the aid of the drawings, in which:

Figure 1 shows an electrical circuit diagram for a line coupling according to the invention.

Figure 2 shows a first bus system using a line coupling.

Figure 3 shows a further bus system using a line coupling.

DETAILED DESCRIPTION OF THE INVENTION

Paragraph beginning on line 23 of page 2 has been amended as follows:

~~It is an object of the invention to provide a~~ A line coupling is provided in which an output line is coupled to an input line, such that the output line is connected to the input line with low impedance only if the output line is not shorted.

Paragraph beginning on line 28 of page 2 has been amended as follows:

~~The object is achieved by the features of patent claim 1.~~

Paragraph beginning on line 30 of page 2 has been amended as follows:

In this case, a large isolation resistor, preferably having a resistance value in the kilo-ohm range, is arranged between the input line and the output line.

Paragraph beginning on line 1 of page 3 has been amended as follows:

Arranged in parallel with the isolation resistor is a controllable switch which can be turned on and off and is preferably in the form of a transistor switch. If the controllable switch is off, as when the input line and the output line are first connected electrically and mechanically, then the input line is connected to the output line only via the large isolation resistor. In the event of a short circuit on the output line, the isolation resistor ~~certainly~~ prevents the short circuit from perturbing the input line and continues to allow operation between stations connected to the input line. However, when the output line is not shorted, data transmission between the input line and the output line is not possible. The input line and the output line serve as transmission medium for data and/or power.

Paragraph beginning on line 17 of page 3 has been amended as follows:

The output line is ~~now~~ provided with a voltage tap which allows the output voltage between the output line and a stipulated reference-ground potential to be measured in the case of a one-wire line, or allows the voltage to be measured between the wires of a two-wire output line. A control circuit controls the switch on the basis of the ascertained output voltage. In this

case, the switch is preferably turned on ~~only~~ when the output voltage ascertained above exceeds a limit value.

Paragraph beginning on line 26 of page 3 has been amended as follows:

If the (slave) station connected to the output line has a dedicated voltage supply, the input voltage can still be applied to the output line. If this slave station is supplied with power via the station connected to the input line, the input line and the isolation resistor are used to supply a supply voltage to the output line, and hence to the slave station, which additionally has a sufficiently high level on the supply line for detection by the control circuit. In this context, the supply voltage may be in the form of a DC voltage signal having a superimposed AC signal which ~~contains~~ includes information. Alternatively, the supply voltage may be provided by an AC signal which optionally ~~contains~~ includes information. If appropriate, such an AC signal is rectified and is smoothed by using a capacitor, for the purpose of tapping off the output voltage. In each case, an output voltage of greater than zero can be detected on the output line when the output line is not shorted. The controllable switch is then automatically actuated in any case and shorts the isolation resistor.

Paragraph beginning on line 19 of page 5 has been amended as follows:

In one advantageous development of the invention, the control circuit ~~contains~~ includes an evaluator for a control word supplied via the input line. The control circuit is then designed such that the switch is operated ~~only~~ when a minimum output voltage is measured and, at the same time, a control word for turning on the switch can be tapped off from the input line and detected. Preferably, a line coupling of such design is used in a bus system in which interconnected stations are connected to one another by means of a respective line coupling. Starting from a master station, to which the rest of the slave stations are connected in a chain or in a ring, each slave station is started up such that the line coupling which is arranged directly upstream of the slave station (in the direction of the master station) is connected first and then

the slave station is allocated an address. The method starts with the first slave station connected to the master station by means of a line coupling. Thus, each nonshorted bus stage can be started up in succession and, as a result of the sequential procedure, each slave station can also be uniquely allocated an address by the master station.

Paragraph beginning on line 27 of page 7 has been amended as follows:

In another advantageous development of the invention, ~~in contrast with the last development described,~~ the evaluators for control words are omitted both on the input side and on the output side. For operation which is independent of direction, it is also advantageous with this line coupling if the switches are enabled only when both the input voltage and the output voltage exceed limit values.

Paragraph beginning on line 1 of page 8 has been amended as follows:

~~The part of the inventive object concerning the use is achieved by the features of patent claim 9.~~

Paragraph beginning on line 3 of page 8 has been amended as follows:

~~Other advantageous developments of the invention can be found in the dependent claims.~~

Paragraph beginning on line 5 of page 8 has been amended as follows:

~~Exemplary embodiments of the invention and developments thereof are explained in more detail with the aid of the drawing, in which:~~

Paragraph beginning on line 8 of page 8 has been amended as follows:

~~Figure 1 shows the electrical circuit diagram for a line coupling according to the invention,~~

Paragraph beginning on line 10 of page 8 has been amended as follows:

~~Figure 2 shows a first bus system using a line coupling, and~~

Paragraph beginning on line 12 of page 8 has been amended as follows:

~~Figure 3 shows a further bus system using a line coupling.~~

Paragraph beginning on line 14 of page 8 has been amended as follows:

Figure 1 shows the electrical circuit diagram for a line coupling according to the invention. A two-wire input line E is connected to a two-wire output line A by means of an isolation resistor 21 in each line path. Arranged in parallel with each isolation resistor 21 is a respective electrically controllable switch 22. Each electrically controllable switch contains two field-effect transistors M1 and M2, and M3 and M4, in series and also a respective resistor R3 and R4. A control circuit 23 is used to operate the switches 22. The control circuit 22 ~~contains~~ includes a comparator 231 for the input voltage, a comparator 232 for the output voltage, an evaluator 233 on the input side, an evaluator 234 on the output side, an AND gate 235, an OR gate 236, a bridge 237, a driver unit 238 and a charge pump 239.

On page 12, line 1, please replace "Patent Claims" with --WHAT IS CLAIMED IS--.

In the Claims:

1. (Amended) A line coupling in a bus system, the system

~~having~~ having an input line ~~(E)~~ and ~~having~~ an output line ~~(A)~~, ~~where~~ comprising:

~~a~~ a master station connected to the line coupling via the input line;

a first slave station connected to the line coupling via the output line;

~~having~~ an isolation resistor ~~(21)~~ coupled between the input line ~~(E)~~ and the output line ~~(A),~~;

~~having~~ a controllable switch ~~(22)~~ connected in parallel with the isolation resistor ~~(21),~~; and

~~having~~ a control circuit ~~(23) for~~ controlling the switch ~~(22)~~ on the basis of an output voltage ~~(U_A)~~ on the output line ~~(A)~~.

2. (Amended) The line coupling as claimed in claim 1, ~~in which~~ further comprising an evaluator ~~(233) is provided for~~ evaluating a control word supplied via the input line ~~(E)~~, and in which the control circuit ~~(23)~~ is designed to control the switch ~~(22)~~ on the basis of ~~the~~ an ascertained control word.

3. (Amended) The line coupling as claimed in claim 1 ~~or claim 2~~, in which a ~~further~~ voltage tap is provided on the input line ~~(E)~~, and in which the control circuit ~~(23)~~ is designed to control the switch ~~(22)~~ on the basis of ~~the~~ an ascertained input voltage ~~(U_E)~~.

4. (Amended) The line coupling as claimed in claim 1 ~~in one of the preceding claims~~, ~~in which a~~ further comprising an evaluator ~~(234) is provided for~~ evaluating a ~~further~~ control word supplied via the output line ~~(A)~~, and in which the control circuit ~~(23)~~ is designed to control the switch ~~(22)~~ on the basis of the ~~ascertained further~~ control word.

5. (Amended) The line coupling as claimed in claim 1 ~~one of the preceding claims~~, in which the control circuit ~~(23)~~ is designed such that the controllable switch ~~(22)~~ is turned on when the output voltage ~~(U_A)~~ exceeds a limit value.

6. (Amended) The line coupling as claimed in claim 2 ~~one of claims 2 to 4~~, in which the control circuit ~~(23)~~ is designed such that the controllable switch ~~(22)~~ is turned on when the output voltage ~~(U_A)~~ exceeds a limit value and a prescribed control word is detected.

7. (Amended) The line coupling as claimed in claim 3 ~~one of claims 3 or 4~~, in which the control circuit ~~(23)~~ is designed such that the switch ~~(22)~~ is turned on when the output voltage ~~(U_A)~~ exceeds a limit value, a prescribed control word is detected and the input voltage ~~(U_E)~~ exceeds a ~~further~~ limit value.

8. (Amended) The line coupling as claimed in claim 4, in which the control circuit ~~(23)~~ is designed such that the switch ~~(22)~~ is turned on when the output voltage ~~(U_A)~~ exceeds a limit value, a prescribed control word is detected at the input or at the output and the input voltage ~~(U_E)~~ exceeds a ~~further~~ limit value.

Please cancel claim 9.

10. (Amended) The ~~use of a~~ line coupling as claimed in claim 1 ~~claim 9~~, wherein the output line ~~(A_i)~~ is the input line ~~(E_{i+1})~~ for ~~a further~~ another line coupling ~~(2_{i+1})~~ and ~~where~~ the output line ~~(A_{i+1})~~ of the ~~further~~ another line coupling ~~(2_{i+1})~~ is connected to ~~a further~~ a second slave station ~~(3_{i+1})~~.

11. (New) The line coupling as claimed in claim 9, wherein additional line couplings are connected in series with one another, and a third slave station is arranged between two data coupling stations.

12. (New) The line coupling as claimed in claim 10, wherein the output line of a last line coupling is connected to the master station.

13. (New) The line coupling as claimed in claim 3, in which the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value and a prescribed control word is detected.

14. (New) The line coupling as claimed in claim 4, in which the control circuit is designed such that the controllable switch is turned on when the output voltage exceeds a limit value and a prescribed control word is detected.

15. (New) The line coupling as claimed in claim 4, in which the control circuit is designed such that the switch is turned on when the output voltage exceeds a limit value, a prescribed control word is detected and the input voltage exceeds a further limit value.